REMARKS

Favorable consideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-3 and 5-26 are presently active in this case, Claim 1 having been amended, Claim 4 having been canceled, and Claim 26 having been added by way of the present amendment.

In response to the outstanding Election of Species Requirement, the Applicants provisionally elect with traverse Species I corresponding to Figure 3, and identify pending Claims 1-3 and 26 as readable on the provisionally elected species.

The Applicants respectfully traverse the election requirement for several reasons.

First, the outstanding Official Action merely includes the conclusory statement that "the application contains claims directed to ... patentably distinct species ..." without stating any basis whatsoever in support of such a finding. This is in violation of MPEP § 816, which states:

> The particular reasons relied on by the examiner for holding the inventions as claimed are either independent or distinct should be concisely stated. A mere statement of conclusion is inadequate. The reasons upon which the conclusion is based should be given. ...

In the absence of any annunciated basis, it is respectfully submitted that the PTO clearly has not carried forward its burden of proof to establish distinctness.

Secondly, MPEP § 806.04(f) requires:

> Claims to be restricted to different species must be mutually exclusive. ..

The outstanding Official Action fails to address in any way whether the pending claims recite mutually exclusive characteristics and this failure provides a further basis for traversing the election requirement.

Finally, MPEP § 803 states:

> ... If the search and examination of an entire application can be made without serious burden, the Examiner must examine it on the merits, even though it includes claims to distinct or independent inventions.

The claims of the present invention would appear to be part of an overlapping search area. Accordingly, the Applicants also respectfully traverse the outstanding Election of Species Requirement on the grounds that a search and examination of the entire application would not place a *serious* burden on the Examiner.

Therefore, it is respectfully requested that the requirement to elect a single species be withdrawn, and that a full examination on the merits of Claims 1-3 and 5-26 be conducted.

With regard to the amendments made to Claim 1, the Applicants wish to explain the limitation "n is the number of the anchor bolts per line." Appendix I has been attached hereto which shows two embodiments; namely, one embodiment in which integer n is three (case 1) and one embodiment in which integer n is four (case 2). There are three pairs of anchor bolts 3A, 3B in case 1, and there are four pairs of anchor bolts 3A, 3B in case 2.

The Applicants also wish to explain the phrases "pivot connection" and "rigid connection." With respect to the pivot connection, see the Appendix II. Appendix II shows the bending moment M on "material dynamics." Example number 2 shows bending moment M with respect to the pivot connection. Note that l_2 in example number 2 is equivalent to h in the present invention. Then $|M|_{max} = Wl_2 \rightarrow Wh$, that is to say, this is the equation (1) at page 9 in the specification. With respect to the rigid connection, see Appendix III. Example number 15 shows bending moment M with respect to the rigid connection. W and l in example number 15 are 2W and 2h in the present invention. Then $|M|_{max} = Wl/8 \rightarrow (2W)(2h)/8 = Wh/2$. That is to say, $|M|_{max} = Wh/2$ is the equation (2) at page 9 in the present specification.

Furthermore, the Applicants would like to provide exemplary figures for the weights

of the guide rail, driving unit, movable unit (cage including several passengers) and counterweight. The guide rail typically weighs 13 kg/m. If the guide rail is a total of 30 m in length, then the weight of guide rail is 390 kg. And the sum weight of driving unit, movable unit including several passengers and counterweight is between about 1,500 kg and about 2,000 kg. Of course, the sum weight depends on the dimensions of elevator system. Therefore, the total weight including the weight of the guide rail is between about 2,000 kg and about 2,500 kg. The rail support members have to support the weight such as between about 2,000 kg and about 2,500 kg. Then n (n is the number of pair of anchor bolts 3A, 3B), and L (L is the distance between anchor bolt 3A and anchor bolt 3B) are very important to the design strength of the fastening plate 2, which is the rail support members in Claim 1 of the present invention. Because, if n or L is smaller than that of designing value previously, then the rail support members cannot support the total weight of the guide rail, driving unit, movable unit including passengers and counterweight and the whole elevator system might fall into the pit, which is the lowest place in the elevator shaft.

The rail support member above in the vicinity of the driving unit and the rail support member below in the vicinity of the driving unit are the most import members, since those rail support members support most of the total weight of the driving unit, the movable unit including passengers, and the counterweight. Other rail support members, except for those support members above and below the driving unit, have to support a little bit more than the weight of the guide rails as such. Therefore, the other rail support members do not require strength intensity comparing with both the rail support members above in the vicinity of the driving unit and the rail support member below in the vicinity of the driving unit.

Regarding the various references of record, the Applicants submit that the references do not render the present invention obvious. For example, U.S. Patent No. 5,899,301 (Aulanko of Kone Oy) describes a disc type motor mounted on one of the guide rails. However, this reference does not explicitly disclose how the guide rail is mounted to the shaft

wall. This reference does not disclose, moreover, how to solve the problem that the fastener plates must support the very heavy weight including the guide unit, the movable unit including passengers, and the counterweight.

U.S. Patent No. 4,593,394 (Russeau of Schindler) describes an elevator guide rail 30A installed on an elevator shaft via rail support member. However, this reference does not disclose how to support the very heavy weight including the guide unit, the movable unit including passengers, and the counterweight.

With respect to CAN 763,771 (Tofanell of Otis), U.S. Patent No. 4,848,519 (Ericson of Otis), U.S. Patent No. 5,950,770 (Koeppe of Inventio), and U.S. Patent No. 6,012,554 (Ito of Otis)., these references do not disclose how to support the very heavy weight including the guide unit, the movable unit including passengers, and the counterweight.

Accordingly, it is respectfully submitted that the present application is in condition for formal allowance. An early favorable action to that effect is therefore respectfully requested.

Respectfully submitted,

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Amendment Filed on: 5-8-02

IN THE CLAIMS

1. (Once Amended) An elevator comprising:

a movable unit configured to ascend and descend in an elevator shaft;

a guide rail installed on said elevator shaft via a plurality of rail support members and configured to guide said movable unit;

a cable configured to hang said movable unit;

a driving unit mounted on said guide rail and configured to move said movable unit up and down by driving said cable; and

at least one of said rail support members fixed to a wall of said shaft by means of at least two [securing members separated from each other by an interval in the vertical direction] vertically spaced lines of securing members separated from each other by an interval in the vertical direction, each line of securing members including at least one securing member, wherein,

said securing members are attached to a plurality of plates in the vicinity of said driving unit,

W is a load applied to one end of said rail support members at which said guide rail is connected,

h is a distance between said shaft wall and said guide rail,

f is a maximum permissible tensile strength of an uppermost of said securing members,

n is the number of securing members per line of said securing members,

L is a distance of said interval, and

$(Wh)/(2fn) \leq L \leq (Wh)/(fn)$.

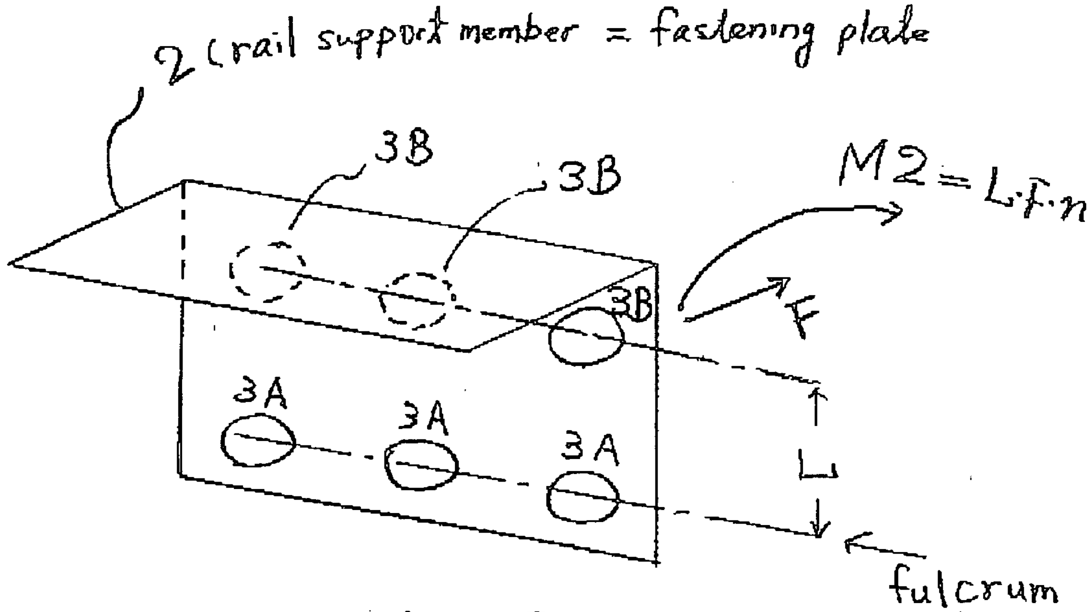
4. (Cancel)

26. (New)

Part of #5

Appendix I

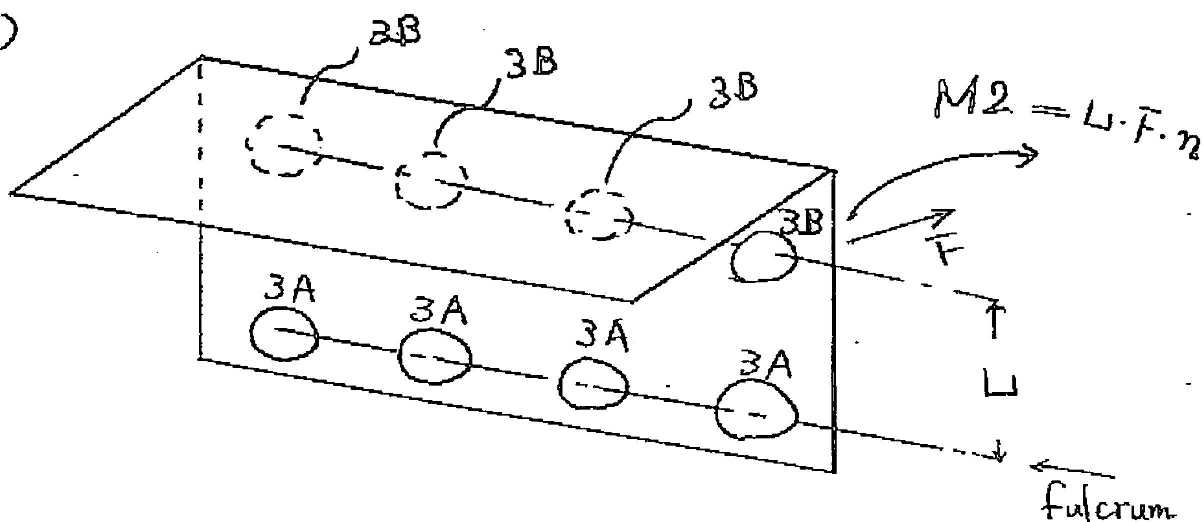
(1)



$n = 3$

3A, 3B : securing member = anchor bolt

(2)

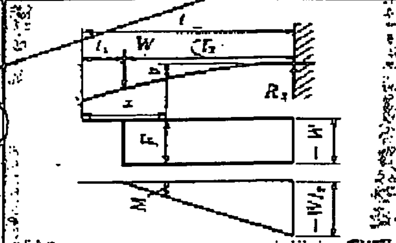
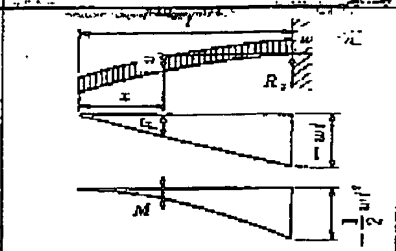
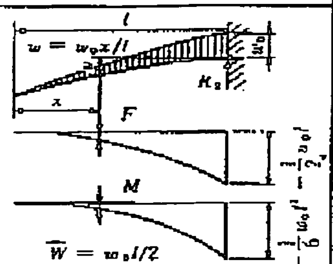
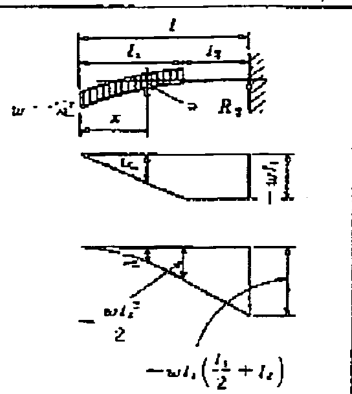
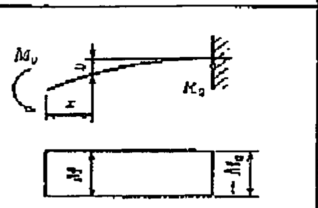
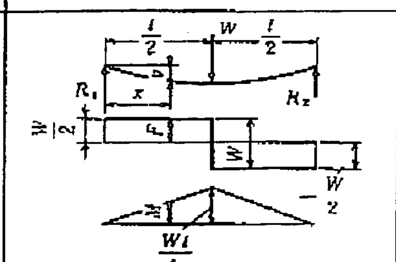


$n = 4$

Appendix II

pivot connection

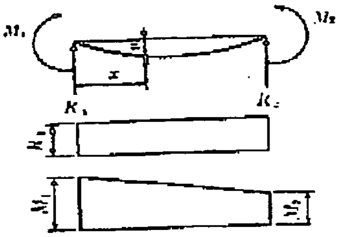
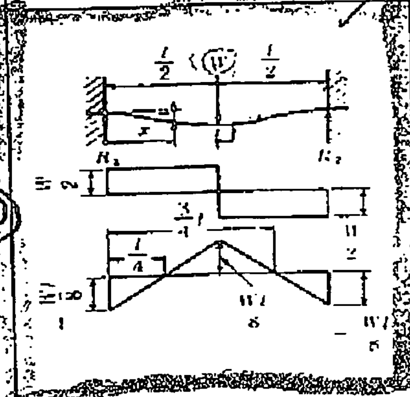
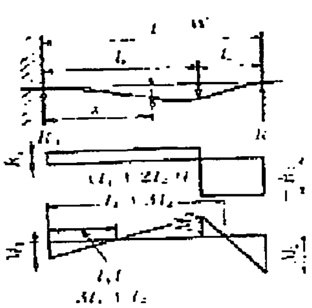
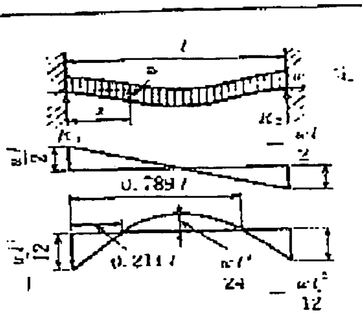
Moment

番号	荷重、弾性線、せん断力図および曲げモーメント図	反力 R およびせん断力 F	曲げモーメント M	たわみ v および傾斜 i
2		$R_2 = W$ $0 \leq x < l_1$ ― $F = 0$ $l_1 < x < l$: ― $F = -W$	$0 \leq x \leq l_1$: ― $M = 0$ $l_1 \leq x \leq l$ ― $M = -W(x - l_1)$ $x = l$ ― $\lvert M \rvert_{max} = W l_2$ $\ell_2 = \ell$	$0 \leq x \leq l_1$ ― $v = \frac{W l_2^3}{3EI}\left\{1 - \frac{3(x - l_1)}{2l_2}\right\}$ $l_1 \leq x \leq l$. $v = \frac{W l_2^3}{3EI}\left\{1 - \frac{3(x - l_1)}{2l_2} + \frac{(x - l_1)^3}{2l_2^3}\right\}$ $x = 0$ ― $v_{max} = \frac{W l_2^3}{3EI}\left(1 + \frac{3l_1}{2l_2}\right)$ $v_{x=l_1} = \frac{W l_2^3}{3EI}$ $0 \leq x \leq l_1$: ― $\lvert i \rvert_{max} = \frac{W l_2^2}{2EI}$
3		$R_2 = wl$ $F = -wx$ $x = l$ ― $\lvert F \rvert_{max} = wl$	$M = -\frac{wx^2}{2}$ $x = l$ ― $\lvert M \rvert_{max} = \frac{wl^2}{2}$	$v = \frac{wl^4}{8EI}\left(1 - \frac{4x}{3l} + \frac{x^4}{3l^4}\right)$ $x = 0$ ― $v_{max} = \frac{wl^4}{8EI} = \frac{\sigma l^2}{4Ee}$ $\lvert i \rvert_{max} = \frac{wl^3}{6EI} = \frac{4}{3l} v_{max}$
4		$R_2 = \overline{W} = \frac{w_0 l}{2}$ $F = -\frac{\overline{W} x^2}{l^2}$ $x = l$: $\lvert F \rvert_{max} = \overline{W}$	$M = -\frac{\overline{W} x^3}{3l^2}$ $x = l$ $\lvert M \rvert_{max} = \frac{\overline{W} l}{3}$	$v = \frac{\overline{W} l^3}{15EI}\left(1 - \frac{5x}{4l} + \frac{x^5}{4l^5}\right)$ $x = 0$. $v_{max} = \frac{\overline{W} l^3}{15EI} = \frac{\sigma l^2}{5Ee}$ $\lvert i \rvert_{max} = \frac{\overline{W} l^2}{12EI} = \frac{5}{4l} v_{max}$
5		$R_2 = wl_1$ $0 \leq x \leq l_1$ $F = -wx$ $l_1 \leq x \leq l$ ― $F = -wl_1$	$0 \leq x \leq l_1$ ― $M = -\frac{wx^2}{2}$ $l_1 \leq x \leq l$ ― $M = \frac{wl_1^2}{2} - wl_1 x$ $x = l$. $\lvert M \rvert_{max} = wl_1\left(\frac{l_1}{2} + l_2\right)$	$0 \leq x \leq l_1$ $v = \frac{w}{24EI}\{x^4 - 4l_1(l_1^2 + 3l_1 l_2 + 3l_2^2)x + l_1(3l_1^3 + 12l_1^2 l_2 + 18l_1 l_2^2 + 8l_2^3)\}$ $l_1 \leq x \leq l$: $v = \frac{wl_1}{6EI}(x - l)^2\left(x + \frac{l_1}{2} + 2l_2\right)$ $x = 0$ $v_{max} = \frac{wl_1}{24EI}(3l_1^3 + 12l_1^2 l_2 + 18l_1 l_2^2 + 8l_2^3)$ $\lvert i \rvert_{max} = \frac{wl_1}{6EI}(l_1^2 + 3l_1 l_2 + 3l_2^2)$
6		$R_2 = 0$ $F = 0$	$M = -M_0$	$v = \frac{M_0}{2EI}(x - l)^2$ $x = 0$ ― $v_{max} = \frac{M_0 l^2}{2EI}$ $\lvert i \rvert_{max} = \frac{M_0 l}{EI}$
7		$R_1 = R_2 = \frac{W}{2}$ $0 \leq x \leq \frac{l}{2}$ ― $F = \frac{W}{2}$ $\frac{l}{2} \leq x \leq l$ ― $F = -\frac{W}{2}$	$0 \leq x \leq \frac{l}{2}$ ― $M = \frac{Wx}{2}$ $\frac{l}{2} \leq x \leq l$ ― $M = \frac{W(l - x)}{2}$ $x = \frac{l}{2}$: ― $\lvert M \rvert_{max} = \frac{Wl}{4}$	$0 \leq x \leq \frac{l}{2}$ $v = \frac{Wl^3}{48EI}\left(\frac{3x}{l} - \frac{4x^3}{l^3}\right)$ $\frac{l}{2} \leq x \leq l$ ― $v = \frac{Wl^3}{48EI}\left\{\frac{3(l - x)}{l} - \frac{4(l - x)^3}{l^3}\right\}$ $x = \frac{l}{2}$, ― $v_{max} = \frac{Wl^3}{48EI} = \frac{\sigma l^2}{12Ee}$ $x = 0, x = l$ ― $\lvert i \rvert_{max} = \frac{Wl^2}{16EI} = \frac{3}{l} v_{max}$

Appendix III

2/2

rigid connection

番号	荷重、弾性線、せん断力図および曲げモーメント図	反力 R およびせん断力 F	曲げモーメント M	たわみ v および傾斜 i
14		$R_1=\frac{M_2-M_1}{l}$ $R_2=\frac{M_1-M_2}{l}$ $F=\frac{M_2-M_1}{l}$	$M=\frac{M_2-M_1}{l}x+M_1$ $M_1>M_2$ のとき $x=0$ … $\lvert M\rvert_{max}=M_1$	$v=\frac{x}{6EIl}\{(M_1-M_2)x^2-3M_1lx+(2M_1+M_2)l^2\}$ $i_{x=0}=\frac{(2M_1+M_2)l}{6EI}$ $i_{x=l}=-\frac{(M_1+2M_2)l}{6EI}$
15		$R_1=R_2=\frac{W}{2}$ $0<x<\frac{l}{2}$: $F=\frac{W}{2}$ $\frac{l}{2}<x<l$: $F=-\frac{W}{2}$ W→2W ℓ→2ℓ	$0<x<\frac{l}{2}$: — $M=\frac{Wl}{2}\left(\frac{x}{l}-\frac{1}{4}\right)$ $\frac{l}{2}<x<l$: — $M=\frac{Wl}{2}\left(\frac{3}{4}-\frac{x}{l}\right)$ $x=0$, $x=\frac{l}{2}$, $x=l$ — $\lvert M\rvert_{max}=\frac{Wl}{8}$ $M=-\frac{W\ell}{2}$	$0\leq x\leq\frac{l}{2}$: — $v=\frac{Wl^3}{16EI}\left(\frac{x^2}{l^2}-\frac{4x^3}{3l^3}\right)$ $\frac{l}{2}\leq x\leq l$: — $v=\frac{Wl^3}{16EI}\left\{\frac{(l-x)^2}{l^2}-\frac{4(l-x)^3}{3l^3}\right\}$ $x=\frac{l}{2}$ — $v_{max}=\frac{Wl^3}{192EI}=\frac{al^2}{24EI}$ $x=l/4$, $x=3l/4$ — $\lvert i\rvert_{max}=\frac{Wl^2}{64EI}$
16		$R_1=\frac{Wl_2^2(3l_1+l_2)}{l^3}$ $R_2=\frac{Wl_1^2(l_1+3l_2)}{l^3}$ $0<x<l_1$: $F=\frac{Wl_2^2(3l_1+l_2)}{l^3}$ $l_1<x<l$: $F=-\frac{Wl_1^2(l_1+3l_2)}{l^3}$	$0<x<l_1$: $M=\frac{Wl_2^2}{l^2}\times\left\{\frac{x(3l_1+l_2)}{l}-l_1\right\}$ $l_1<x<l$: $M=\frac{Wl_1^2}{l^2}\left\{l_1+2l_2-\frac{x}{l}(l_1+3l_2)\right\}$ $x=0$: $M_1=-\frac{Wl_1l_2^2}{l^2}$ $x=l$: $M_2=-\frac{Wl_1^2l_2}{l^2}$ $x=l_1$: $M_3=\frac{2Wl_1^2l_2^2}{l^3}$ $l_1\gtrless l_2$ により $\lvert M_1\rvert\lessgtr\lvert M_2\rvert\lessgtr\lvert M_3\rvert$	$0\leq x\leq l_1$: — $v=\frac{Wl_2^2x^2}{6EIl}\left\{\frac{3l_1}{l}-\frac{(3l_1+l_2)x}{l^2}\right\}$ $l_1\leq x\leq l$: $v=\frac{Wl_2^2x^2}{6EIl}\left\{\frac{3l_1}{l}-\frac{(3l_1+l_2)x}{l^2}\right\}+\frac{W(x-l_1)^3}{6EI}$ $v_{x=l_1}=\frac{Wl_1^3l_2^3}{3EIl^3}$ $l_1>l_2$ のとき $v_{max}=\frac{2Wl_1^3l_2^2}{3EI(3l_1+l_2)^2}$ $\left(x=\frac{2l_1l}{3l_1+l_2}\text{ にて}\right)$ $v_{x=l/2}=\frac{Wl_2^2(3l_1-l_2)}{48EI}$ $l_1\gtrless l_2$ によらず $i_{x=l_1}=\frac{Wl_1^2l_2^2(l_2-l_1)}{2EIl^3}$
17		$R_1=R_2=\frac{wl}{2}$ $F=\frac{wl}{2}-wx$ $x=0$, $x=l$: — $\lvert F\rvert_{max}=\frac{wl}{2}$	$M=\frac{wl^2}{2}\times\left(-\frac{1}{6}+\frac{x}{l}-\frac{x^2}{l^2}\right)$ $M_{x=l/2}=\frac{wl^2}{24}$ $x=0$, $x=l$ — $\lvert M\rvert_{max}=\frac{wl^2}{12}$	$v=\frac{wl^4}{24EI}\left(\frac{x^2}{l^2}-\frac{2x^3}{l^3}+\frac{x^4}{l^4}\right)$ $x=\frac{l}{2}$: — $v_{max}=\frac{wl^4}{384EI}$ $x=l\left(\frac{1}{2}\mp\frac{\sqrt{3}}{6}\right)=0.211l,\ 0.789l$: — $\lvert i\rvert_{max}=\frac{\sqrt{3}}{216}\frac{wl^3}{EI}$